Mars Electric Reusable Flyer

Completed Technology Project (2015 - 2016)

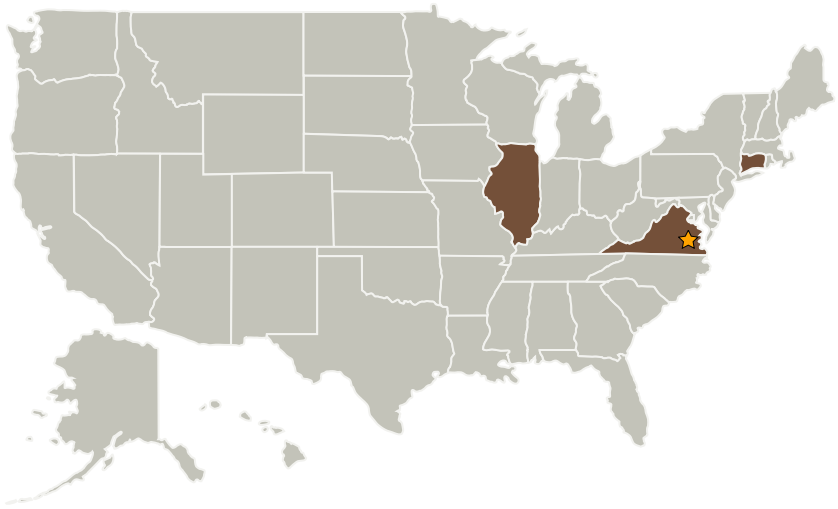
Project Introduction

Research will include further development of the vehicle configuration. It will continue the current Autonomy Incubator effort of developing visual odometry algorithms and Simultaneous Linearization and Mapping (SLAM) algorithms for specific application to Mars navigation in canyons and lava tubes. This effort will include wind tunnel testing in the LaRC TDT at Mars flight Reynolds number conditions to validate the design in Mars flight conditions. In addition, vacuum chamber tests and a balloon drop from high altitude (approximately 100k feet) will be performed to verify vehicle controllability and performance in Mars atmosphere density conditions.

Anticipated Benefits

Goal to mature the technology so it can be a payload on the Mars 2020 mission. Flight on Mars would allow better navigation scouting for the ground rover, identification of high-value science targets, and gathering of ultra-high definition imagery for science purposes and the future human missions.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Center Innovation Fund: LaRC CIF

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Organizations Performing Work	Role	Type	Location
★Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
The Boeing Company(Boeing)	Supporting Organization	Industry	Chicago, Illinois
University of Connecticut	Supporting Organization	Academia	Storrs, Connecticut
University of Illinois at Urbana-Champaign	Supporting Organization	Academia	Urbana, Illinois

Primary U.S. Work Locations	
Connecticut	Illinois
Virginia	

Project Website:

https://www.nasa.gov/directorates/spacetech/home/index.html

Project Management

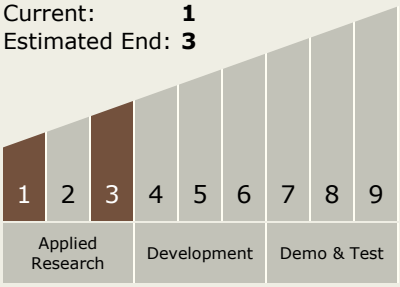
Program Director:
Michael R Lapointe

Program Manager:
Julie A Williams-byrd

Principal Investigator:
David D North

Technology Maturity (TRL)

Start: **1**
Current: **1**
Estimated End: **3**



Technology Areas

Primary:

- TX04 Robotic Systems
  - TX04.2 Mobility
    - TX04.2.2 Above-Surface Mobility